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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/729,751	12/04/2003	Anthony R. Bonaccio	BUR9-2003-0099	3178

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EXAMINER	
BAE, JI H	

ART UNIT	PAPER NUMBER
2115	

DATE MAILED: 03/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/729,751	BONACCIO ET AL.	
	Examiner	Art Unit	
	Ji H. Bae	2115	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) *23-30* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *12-4-03*.
4) ☒ Interview Summary (PTO-413) Paper No(s)/Mail Date. *20060323* .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

I. Claim 1-22, drawn to an integrated circuit and a method of repairing an integrated circuit, classified in class 713, subclass 502.

II. Claim 23-30, drawn to a method and computer system for designing a repairable integrated circuit, classified in class 716, subclass 1.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as process of making and product made. The inventions are distinct if either or both of the following can be shown: (1) that the process as claimed can be used to make another and materially different product or (2) that the product as claimed can be made by another and materially different process (MPEP § 806.05(f)). In the instant case the product as claimed can be made by a materially different process.

Because these inventions are independent or distinct for the reasons given above and have acquired a separate status in the art in view of their different classification, restriction for examination purposes as indicated is proper.

During a telephone conversation with William H. Steinberg on 22 March 2003 a provisional election was made without traverse to prosecute the invention of group I, claims 1-22. Affirmation of this election must be made by applicant in replying to this Office action. Claim 23-30 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claim Objections

Claims 3, 7, 10, 12, and 14 are objected to because of the following informalities: there appear to be numerous typographical errors throughout the claims.

- Claim 3, line 1: "The integrated circuit **if** claim 1";
- Claim 7, line 3: "...an individual **devices**, a transistor a diode, a **resistors**...";
- Claim 10, line 1: "The integrated circuit of claim 1, wherein **in**";
- Claim 12, line 2: "a pulse **generated adapted** to generate a pulsed signal";
- Claim 14, line 1: "The method **if** claim 12";

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 12-22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 12, the typographical error in line 2 renders the scope of the claim indefinite, as it is unclear to the examiner what is being claimed. Claims 13-22 are rejected by virtue of their dependency.

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claim 12 is rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Regarding claim 12, applicant has recited a "method of preemptively repairing an integrated circuit". However, applicant has only listed steps for providing the various components in the circuit that are needed to provide the repairing feature. Applicant has not recited any steps that actually accomplish the repairing step. Therefore, applicant's method does not achieve the claimed objective of preemptively repairing an integrated circuit. As such, applicant's claimed method is non-statutory because it does not provide a useful, concrete, or tangible result.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-5, 10, 12-16, and 21 are rejected under 35 U.S.C. 102(b) as being anticipated by Evans et al., U.S. Patent No. 6,425,092 B1.

Regarding claim 1, Evans teaches an integrated circuit comprising:

a pulse generator adapted to generate a pulsed signal;

a cycle counter adapted to count cycles of said pulsed signal [Fig. 3, interval timer 60];

one or more repairable circuit elements [chip section 1 and chip section 2];

and a repair processor adapted to repair a repairable circuit element when said cycle counter reaches a pre-determined cycle count [control logic and I/O switching logic].

The interval timer of Evans counts to a predetermined time period, after which it issues a signal to the control logic to switch between chip sections 1 and 2 [col. 4, lines 10-22]. The chip sections are redundant, and are used to substitute for one another when there is a risk of overheating, determined in this case by a predetermined interval timer value. Since the interval timer is used to count to a predetermined time value, it must inherently count cycles of a pulsed signal (e.g. a clock).

Regarding claim 2, Evans teaches that the repair processor replaces said repairable circuit element with a redundant circuit element having the same function as said repairable circuit element.

Regarding claim 3, Evans inherently teaches a clock signal.

Regarding claim 4, Evans teaches a memory circuit adapted to store a cycle count of the number of cycles counted since an initial power up and to resume counting from said stored cycle count after a power down/power up cycle of said integrated circuit [sequential switching, initial offsets after reset, col. 4, lines 23-33].

Regarding claim 5, Evans teaches that the cycle counter is adapted to generate a trigger signal [Fig. 3, switch signal] when said predetermined cycle count is reached and said repair processor is adapted to receive said trigger signal and affect a repair of said repairable circuit element when said trigger signal is received.

Regarding claim 10, Evans teaches that said repair processor is adapted to perform multiple repairs by repairing previously repaired repairable circuit elements.

Regarding claims 12-16 and 21, Evans teaches the integrated circuit of claims 1-5 and 10. Evans also teaches the method implemented by the claimed integrated circuit.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 6-9, 11, 17-20, and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nogami et al., U.S. Patent No. 5,459,342, in view of Evans et al.

Regarding claim 6, it would have been obvious to one of ordinary skill in the art to implement the trigger signal as a subset of a set of bits encoding a current cycle count. Such implementation is commonly used in the art. For example, a most significant bit of a counter is often used an overflow or strobe signal whenever a counter has exceeded a predetermined value.

Regarding claim 7, the limitations recited are obvious in view of design choice. It would have been obvious to one of ordinary skill in the art that the inventive teachings would apply to any kind circuit element.

Regarding claim 8, Nogami teaches an FPGA that is capable of replacing a defective circuit element by programming previously unused gates of the FPGA. Nogami does not teach the limitations recited in claim 1 taught by Evans.

It would have been obvious to one of ordinary skill in the art to combine the features of Nogami and Evans by providing Nogami with a counter and control logic taught by Evans. Both Evans and Nogami are directed towards systems for performing self-repair on an integrated circuit. Although Nogami teaches that such self-repair is possible, Nogami does not outline

particular scenarios in which such repair would be necessitated. Evans teaches that it would be beneficial to preemptively avoid thermal failure in integrated circuits by periodically replacing the active circuit element. The teachings of Evans would improve the system of Nogami by providing this feature.

Regarding claim 9, Nogami teaches a fuse bank for storing information used to implement a repair [Fig. 1, connecting means 131, col. 3, lines 14-21].

Regarding claim 11, it would have been obvious to one of ordinary skill in the art to provide a redundant cycle counter and replace the cycle counter after a fixed count. Since the system of Nogami teaches an FPGA, the logic cells are customizable to provide any kind of function for the spare circuit block.

Regarding claims 17-20 and 22, Nogami and Evans teaches the integrated circuit of claims 6-9 and 11. Nogami and Evans also teaches the method implemented by the integrated circuit.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

Anand et al., U.S. Patent No. 6,577,156 B2;

Gunawardana et al., U.S. Patent No. 6,993,446 B2;

Ochi, U.S. Patent No. 5,654,896;

Matsuo et al., U.S. Patent No. 6,812,557 B2;

Angle et al., U.S. Patent No. 6,814,296 B2;

Carlson, U.S. Patent No. 6,861,865 B1;

Chaisemartin, U.S. Patent No. 6,586,961 B2;

Deguchi, U.S. Patent No. 6,153,450.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ji H. Bae whose telephone number is 571-272-7181. The examiner can normally be reached on Monday-Friday, 10 am to 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas Lee can be reached on 571-272-3667. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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